
Jennifer Stock:

Welcome to the first Ocean Currents of the year on KWMR, Point Reyes Station and Bolinas. I look forward to bringing you newsy information about our blue planet this year. On Ocean Currents, I host experts in the field that bring us news about the ocean. This blue planet controls our climate, weather, provides food and recreation, and provides a home to so many plants and animals.

My name is Jennifer Stock and I bring this show to you from the Cordell Bank National Marine Sanctuary. The sanctuary itself is just about 15 miles offshore of Point Reyes and Bodega Bay sitting just north of Gulf of the Farallones and Monterey Bay. This is the last Monday broadcast of Ocean Currents. We are moving to Thursdays at 5:30pm. So, Ocean Currents will start broadcasting on one Thursday evening a month at 5:30pm, the first show beginning February 8th and it will be rebroadcast the following Thursday at 5:30pm as well.

I hope you'll be able to tune in then. If not, you can catch past episodes that are archived on the Cordell Bank National Marine Sanctuary website at cordellbank.noaa.gov. That's C-O-R-D-E-L-L dot...or Cordell Bank, B-A-N-K dot NOAA, N-O-A-A, dot G-O-V. It's been awfully chilly lately and I've been craving the warmer tropical waters to warm my fingertips. So, today we are going to head east and south to the Gulf of Mexico to learn about the Flower Garden Banks National Marine Sanctuary, a sister sanctuary here to Cordell Bank, a place where healthy and diverse coral reefs are thriving visited by sea turtles, sharks, manta rays, whale sharks, and, of course, the local, colorful reef inhabitants themselves. So, think: warm water.

You barely need a wetsuit here. When we return, we'll be talking with Ms. Shelley DuPuy, the education coordinator for this sanctuary and to get you in the mood for this place, here is an audio clip from the Flower Garden Banks Coral Reefs. See if you recognize any sounds.

(Coral Reef Audio)

Jennifer Stock:

Boy, I could listen to that all day. It's quite a beautiful, noisy place down there in the Flower Gardens. I have Shelley DuPuy on the line. Welcome, Shelley.

Shelley DuPuy:

Thank you, Jennifer. It's a pleasure to be here.

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- Jennifer Stock:* Oh, thanks for joining me on Martin Luther King Day. A very special day indeed to recognize a famous leader here. Shelley is the education coordinator for the Flower Garden Banks National Marine Sanctuary off the coast of Texas in the Gulf of Mexico and Shelley, 2007 is kicking off a great start to a very special year for the Flower Garden Banks National Marine Sanctuary. What are you celebrating this year?
- Shelley DuPuy:* Jennifer, we're celebrating 15 years of being a national marine sanctuary. The effort to have the sanctuary designated, or the idea to have it designated, first popped up in 1972, but things didn't really get rolling until 1992 when we were finally officially designated. So, 15 years.
- Jennifer Stock:* Can you maybe orient us to...since most of us listening are here in California, tell us where the Flower Garden Banks is and give us a little rundown of what this place is all about.
- Shelley DuPuy:* Well, if you can picture in your mind Texas and Louisiana and, after Katrina I think everybody's familiar with the Gulf of Mexico map, but if you'll just look at the Texas-Louisiana border and go straight south about 100-115 miles and then go down about 60 feet, you'll hit the peak of the Flower Garden Banks National Marine Sanctuary. So, it's up there just, just on the edge of the continental shelf. If you went a little further south there'd be a very drastic drop and the water would get deep down into the...couple of thousand feet.
- So, it's kind of an unusual place to find a coral reef, but there it is!
- Jennifer Stock:* And this is one of the most, northernmost, coral reefs in the United States as well, isn't it?
- Shelley DuPuy:* It is. It's actually the northernmost in the continental United States. Now, our newest marine protected area over in the northwestern Hawaiian Islands, their coral reefs are further north than ours and then I believe there's one other, it escapes me right now, but on the continental U.S. we are the northernmost and that's...the corals are right there at the very edges of temperature tolerances for extreme cold and extreme hot for water temperature.
- Jennifer Stock:* Excellent. So, those listening may be wondering, "What is a national marine sanctuary anyway?" They hear me every month, "Cordell Bank National Marine Sanctuary." Can you describe what

does a national marine sanctuary do and why did the National Flower Garden Banks receive such honors?

Shelley DuPuy: Well the national marine sanctuaries are designated because they're special marine places for a variety of reasons. It could be of historic significance, it could be of cultural significance, possibly an ecological significance, or recreational or just aesthetic, but they all have at least one reason that makes them special and outstanding among the general marine areas. The Flower Garden Banks were designated because of those healthy coral reefs and people were a little bit concerned that offshore petroleum exploration and production was beginning to pick up in the 70's in the Gulf of Mexico and a lot of pipelines were being laid and a lot of wells were being drilled.

So, there was a little bit of concern that that might have some kind of negative impact on these reefs and because they were so unique in the area and were such a productive place to the Gulf of Mexico, there was a movement to protect them initially from oil and gas, but then also, ultimately, from all types of activities. So, there are certain types of activities that are regulated or, if not prohibited, they're at least limited in some manner such as certain types of fishing are not allowed because they would destroy the bottom habitat. So, the purpose was to protect this area that people considered unique and valuable and if it disappears, we can't get it back because it takes hundreds of years for a coral colony to grow, much less a entire reef.

Jennifer Stock: So, how did Flower Gardens actually get discovered. It seems like it's kind of a mystery to me being on the Continental Shelf there that there's this incredible coral reef and I luckily was able to dive there a couple years ago. It was part of one of your education workshops, Shelley, and was absolutely blown away by the amount of color and life that was out there 100 miles offshore. So, how did the Flower Garden Banks get discovered and about when did that happen?

Shelley DuPuy: That's a very interesting story, actually. It was in the late 1800's to early 1900's and they were actually discovered by early snapper fishers. This was back before we had the huge boats that would stay out for months at a time, but they were still gone quite a while and when...they actually travelled quite far offshore and on a clear day, even though it's 60 feet down, on a clear day you can actually see the coral reef below and the fishermen would see all the colors on the reef and they just thought they looked like gardens of

flowers. So, they nicknamed them the Texas Flower Gardens and they were a very popular fishing spot, apparently, in the early 1900's.

Then people kind of forgot about them as different modes of fishing came along and they were able to access other areas that were even further offshore and they were kind of rediscovered again in the 1960's. There was a disagreement among scientists as to whether these so-called reefs that the fishermen found were really there or if they were live reefs or dead reefs because the thought was that it would be too cold for coral reefs that far north. So, there was a gentlemen at the Houston Museum of Natural Science who decided that he would launch an expedition to find out and he got together with the Navy who needed an opportunity to train the Navy reserve folks on maneuvers and they chose to go out to the Flower Gardens to practice their maneuvers and got a bunch of volunteer divers to dive on them and lo and behold it was live coral.

So, they brought back some samples for proof and for scientific purposes and the rest is history.

Jennifer Stock:

See, you know, it seems just a matter of time from the science community and environmental community to want to protect that amazing resource that was somewhat of a mystery and special northern area for coral reefs.

Shelley DuPuy:

It really was and I have to say that the evolution of technology has played a huge role in helping us learn about them. Number one: had scuba diving not come into being we would not have discovered that they were live in the first place, most likely, and secondly, from then on as technology improves we're able to go deeper and stay longer and really explore these areas. So, we're still learning a lot. The Flower Garden Banks still hold a lot of secrets.

Jennifer Stock:

Excellent. Those are the most fun to find out about, too. So, coral reefs, they don't just pop up out of nowhere. It seems they need some type of substrate or something for the corals to live on or attach to and then they build from there these colonial areas. The Flower Gardens have an incredible geologic history that make it unique. Can you describe what the base layer under all that coral is like?

Shelley DuPuy: Well, they're actually perched on top of salt domes and if you think of just rolling hills, that's probably, if you looked at the Gulf as a whole, they would seem like hills even though they rise up from 350 foot. So, they're...to sixty feet. So, they're about 300 foot tall, which, y'all probably wouldn't consider mountains out there, would you? 300 feet tall, they're foothills. So, and the salt domes form just because of the movement of the Earth.

Back when before the last ice age there was a lot of salt deposited in the Gulf of Mexico. It was very shallow, very humid, there was a lot of evaporation going on, a lot of settling out of different types of salt. Then when you had the ice age come along it covered everything up and as the ice age began dissipating you had a lot of sediment being dumped down into the Gulf of Mexico as the ice melted. So, all that sediment packed down on top of the salt that was already there and things got very heavy and the Earth's crust began shifting around and buckling.

So, any time you had some buckling going on and the salt, which was less dense than the sediment above it, the salt would then try to seep up in any little nook or cranny it could find and eventually would hit some layer of sediment that it couldn't move through. So, it kind of collected in a little ??? under the sediment. So, the salt dome would look, on the surface, like a hill, but if you would've drilled down through the layers you would go through several different types of sediment until you eventually reached this salty, gaseous, oily mix that also happens to be where the oil and gas collects, which is why we have so much oil and gas production in the Gulf of Mexico.

So, I'm not sure that gave a very good, precise visual...

Jennifer Stock: It definitely gives a visual to me because every time I've heard of salt domes, I just have this visual picture of piles of salt that, you know, come from the surface and come down, but this is so interesting in that it actually was pushing up, trying to come to the surface as the density of the Earth changed and the sea level changed as well and so this created a substrate and you were mentioning earlier people were having a hard time believing coral reefs existed this far north. So, how did these corals move into the Gulf of Mexico and find this substrate. Is there much studies done on that?

Shelley DuPuy: There had been some studies done and the current patterns in the Gulf are really variable, but you have one basic pattern where the

current, Caribbean current, sweeps around the Yucatan Peninsula of Mexico, sweeps up the middle of the Gulf of Mexico and then takes a right turn, moves along the coast of Louisiana, Alabama, Mississippi, and north Florida and then turns and moves down the western side of Florida until it gets around the Florida peninsula and moves north at which point is called the Gulf Stream. While it's in the Gulf of Mexico it's called the Gulf Loop because it's looping around in the Gulf and then going out the other side. Now, it varies as to how far north that loop will go.

Sometimes it gets quite close to the coast and sometimes it barely moves into the gulf and that has a lot to do with prevalent water temperatures and the way the wind is running. So, what happens when that current goes up and around, if you can picture little eddies, little circular pieces....little water....chunks of water, I guess, if you will, rotating, spin off of that and move westward. So, they go right over the Flower Garden Banks and bathe it in warm water and makes that local, the local current patterns quite variable in that area, which is one of the reasons it's considered an advanced scuba dive as opposed to a beginner's scuba dive because the currents are so variable, but it's that Caribbean current coming up that bathes the banks in warm water and keeps those temperatures within, barely within, the range of corals because corals really only do well if the water is between 68 and 85 degrees centigrade.

If it gets much higher than that for too long they start bleaching and if it gets lower than that for too long they just don't grow.

Jennifer Stock: Well, I have to say I definitely experienced that current when I was in the Flower Garden Banks and I have fond memories of sitting at 15 feet at a nice safety stop with my scuba mask smashed against my eyes from the current being so strong, holding on to all my equipment, hoping it would stay there with barracudas sitting there looking at me like, "Ok, what's she gonna lose?" And it was pretty adventurous. It was fun.

Shelley DuPuy: It is and I always really envy the barracuda because it seems so effortless to them.

Jennifer Stock: Yeah, they just sit there...

Shelley DuPuy: ...you're hanging on for dear life and they're looking at me like, "So, what's your problem?"

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- Jennifer Stock:* So, let's do a little bit....I want to review a little bit about coral biology. That's coral...we don't have a lot of tropical corals here in California. We have cold, temperate reef corals, but they're different than some of these tropical corals that are down in the southern latitudes between this temperature range of 68 to 85. So, can you give us a quick biology lesson on what makes a coral a coral?
- Shelley DuPuy:* Well, like you said, there are a couple of different types of coral. The ones that you're referring to that you have there on the west coast are in a group that most people generally refer to as soft coral and they have a much wider temperature range. What we call hard coral that the scientists call hermatypic corals, are more boulder-shaped. They're not small and willowy. They can't move with the current. They're just solid boulders and they're very picky about their temperatures.
- I can understand corals because they like it between 68 and 85. So, they're extremely picky and in the boulder corals they tend to...the colony expands slowly year to year and we actually have colonies out there that are the size of VW buses and when I say colony, you have to imagine that it started with one teeny tiny little animal about the size of a pencil eraser. That would be the polyp and when it was hatched it had to find a hard surface to settle on and that hard surface had to be in one of those warm places and it also had to be in a place where it could get a lot of sunlight because the hard coral have a symbiotic relationship with the type of algae known as zooxanthellae and that algae photosynthesizes sugars using the sunlight and then shares those sugars with the coral as food.
- So, without that algae the corals don't survive very well. So, they have to settle in a place that's close enough to the surface in water that's clear enough for the sunlight to get through. So, just imagine that one little pencil eraser started all by its lonesome and then thousands of years later, it's in a colony the size of a VW Bus. So, it worked hard to get where it is today.
- Jennifer Stock:* They did work hard to get where they are today and I'm sure there's a lot of fear about what's going to happen in the future. There's so many threats on the horizon and that we're experiencing right now. For those just tuning in or have been listening, you're listening to Ocean Currents with Jennifer Stock and my guest today is Shelley DuPay from the Flower Garden Banks National Marine Sanctuary. So, Shelley, you just described this incredibly beautiful animal. They have these great temperature ranges, pretty shallow, they

need clear enough water and those of use paying attention in the media or might be reading that coral reefs around the world as receiving attention as many of them are in steep decline due to many human-induced actions, what are some of these threats that coral reefs are facing and how about the Flower Garden Banks? How are they being affected by some of these threats?

Shelley DuPuy:

Coral reefs around the world are facing a lot of different threats and most of them, right now, that you can see the most immediately impacts of are from human activities. There are a lot of...you may have heard of bleaching and bleaching is just a case of where those algae that we just discussed, when the temperatures get too warm the algae is expelled from the coral or some people believe it may just die off and still have a little seed there, but for whichever mechanism it is, the coral no longer has the algae producing food for it and as long as the temperatures remain too warm, that algae will not return. Now, if that coral was healthy to start with when this bleaching event occurs, it can often recover once the water temperatures get back to normal and either regrow the algae if you think that was the mechanism or attract new algae and ingest it if you believe they were actually expelled.

So, whichever the case is, if they don't have the algae they will eventually starve to death. They do have a couple of other mechanisms for obtaining nutrition, but those mechanisms are fairly small compared to the algae's symbiotic relationship. So, bleaching is one of the big concerns. Just water quality is one of the largest. If you're, for example, constructing a motel and you don't have proper sediment control and it washes off into the near-shore waters, the sunlight can't get through. So, the corals can't do their little bit with the algae. Even for those corals that don't have symbiotic algae, if they get covered in sediment, they're live animals. They have the same response that you and I would have if we got a truckload of dirt dumped on us. We'd probably find it difficult to survive...

Jennifer Stock:

Right.

Shelley DuPuy:

...unless we had assistance. So, water quality is a biggie. Excess nutrients causing algal blooms that can then outcompete the corals just all kinds of disastrous things can happen if you're a coral sitting out there unable to move out of the way.

Jennifer Stock:

And since you're in the Gulf of Mexico, what is the percentage of the watershed that drains into the Gulf of Mexico from the U.S.?

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- Shelley DuPuy:* Two-thirds of the continental U.S. drains into the Gulf of Mexico. So, all of the agriculture that goes on, every time your car drips oil on the highway and a rainstorm comes along, that ends up in the Gulf of Mexico, every time you fertilize your lawn, every time you put pesticide on your lawn, that all drains down into the Gulf of Mexico. Every time you flush your toilet, yes, it goes through a treatment plant, but it still ultimately ends up in the Gulf of Mexico. So, that's...water quality is one of the biggest issues all oceans are facing.
- Jennifer Stock:* Yeah, even though we don't live near the Gulf of Mexico, it definitely effects our Pacific ocean over here. What is in...that two-thirds of the U.S., what is the somewhat geographic boundaries of that? Is it east of a certain mountain range and to what...what are the boundary states to that watershed?
- Shelley DuPuy:* Oh, that's...let me pull my map out! You can actually find that map on our website...
- Jennifer Stock:* Oh, okay
- Shelley DuPuy:* ..at www.flowergarden.noaa.gov and I'm sorry, you don't actually have to have the W-W-W.
- Jennifer Stock:* Right.
- Shelley DuPuy:* It's just flowergarden.noaa.gov. I don't have the specific states memorized, but it's generally the middle of the U.S.
- Jennifer Stock:* That's a lot of people to educate, Shelley.
- Shelley DuPuy:* It is. So, we appreciate folks like you helping us educate those folks.
- Jennifer Stock:* Aw. Well, it's just amazing to me and I'm, you know, one of the things that I've been thinking about, I mean, I was thinking about it immediately when Hurricane Katrina was going on and witnessing the incredible amounts of debris and toxics washing out into the Gulf, I just kept thinking, "Oh the Flower Garden," and I'm wondering, do you know if the state or the, you know, agencies in the Gulf of Mexico have been somewhat monitoring that outflow of toxics and is this a potential threat, a further threat, to the flower gardens?

Shelley DuPuy: I know that there was some monitoring in the first days and weeks after Katrina and Rita. Rita came in, as you'll recall, a few weeks after Katrina. We did just very basic monitoring because we did notice from the aerial, from the satellite photographs, that it looked as though some of that might be, might actually make it out to the Flower Garden Banks. 100 miles seems like a long way, but we do occasionally see evidence that water from the Mississippi River or some other river system going into the Gulf does make it out that far eventually. We did not...we were not able to get out there quick enough after the hurricane to do any detailed water quality monitoring.

We did do some, but if there was an impact, we were too late to see if or it was well deluded by the time it got there. I know that closer to shore it had some pretty devastating effects...

Jennifer Stock: Right.

Shelley DuPuy: ...on the wildlife and I know there were oil and gas structures, there was a lot of concern, some of those were actually uprooted and moved and the spills were, as I understand it, pretty amazingly small considering the havoc that Katrina reeked when she went across the Gulf. So...

Jennifer Stock: Well, I'm sure there will be more of those to come and it sounds like the coral reefs are able to withstand a lot of that energy from the storms and that perhaps, maybe the bigger threats are from the humans when these storms come through.

Shelley DuPuy: Yeah, we did see some direct physical damage from Rita, which came within a few miles of the sanctuary and she, Rita, upturned even 60-90 feet deep.

Jennifer Stock: Oh, wow.

Shelley DuPuy: She turned over coral heads and you'd see places on the reef that used to be filled with sand had kind of been scoured out. You'd see a lot of sand dumped into like, the big barrel sponges, which are also animals. So, they're not going to survive long if the sand stays there forever, but all in all, they weathered the actual passage of the storm pretty well and so far we haven't seen any measurable impacts even from the water quality, but I just want to make a cautionary note here that just because we didn't see it this time and just because it appears to be deluded when the Mississippi River gets to the Gulf of Mexico, that doesn't mean it's infinite.

Jennifer Stock: Yeah. It doesn't mean it's over. It's cumulative and it's adding up.

Shelley DuPuy: We will eventually dump so much stuff into the ocean that mother nature can't cleanse it. So, we need to work on that.

Jennifer Stock: We're working on it.

Shelley DuPuy: Yes, we are.

Jennifer Stock: Well, listen, it's just about 1:30. I need to take a short break and I'd love if you'd just stay on the line a little bit and we'll talk a little bit more about the sanctuary.

Shelley DuPuy: Okay.

Jennifer Stock: And I think we'll go diving again. I really enjoyed those scuba bubbles. So, stay tuned.

(Coral Reef Audio)

Jennifer Stock: I just love listening to those bubbles and hearing those fish grunt and croak and those shrimps snapping. It's hysterical. It's a big party going on down there, Shelley.

Shelley DuPuy: There is! It's its own little Metropolis.

Jennifer Stock: I wanted to also mention to listeners that are tuning in that in about 10 or 15 minutes, we'll be talking with Krist Jake from the San Francisco Ocean Film Festival and hearing about a local event here in San Francisco that's highlighting ocean films. It's a great event, so we'll talk to Krist in about 10 or 15 minutes, but Shelley we have about 10 more minutes with you and I just, you know, we were just talking about some of the human impacts in this area and it's hard to avoid the thought about a potential accident happening with the industry that's in the Gulf. You said there's quite a bit of oil platforms, what would you say, hundreds, thousands of oil platforms in the gulf?

Shelley DuPuy: I'm not even going to go there. I'd say more than a hundred, definitely, but I'm not going to try to make a guess. I haven't looked at that in quite a while. I know that we have quite a few within a couple mile range of the sanctuary.

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- Jennifer Stock:* I remember coming out on the boat and thinking, "Oh, I'm a hundred miles offshore. It should be dark. It...oh my gosh. There's quite a bit of lights out here." It was kind of like a little city out there.
- Shelley DuPuy:* There is because there are all of those navigation concerns when you have a platform out there in the middle of the Gulf and at night it has to be lit up. Otherwise, you'd have ships running over them all the time. So, it is quite light, much lighter than you would expect out there. We've actually been fortunate. We do have an active gas production platform inside the sanctuary boundary that was grandfathered in. It was there before the sanctuary was and we've been very fortunate that the oil and gas industry in general has been very cooperative in establishing extra precautionary measures and adhering to them on a voluntary basis.
- So, the monitoring that we do started back before we were even a sanctuary. It started back in the 70's and to date we haven't been...we haven't seen any measurable impact from the oil and gas industry on the reef itself. Now, you know, one of the things that protects the flower gardens in general and one of the reasons it's so pristine and has had so few incidences of disease and bleaching is because we're so far removed from everything. So, even if there is a pipeline oil spill in the Gulf, it would have to be pretty close to the Flower Gardens themselves before it would have an impact, a measurable impact on them.
- So, we've been very fortunate that way and hopefully we'll continue to have that great working relationship with the industry.
- Jennifer Stock:* I think that's one of the benefits of an area being designated a national marine sanctuary is it creates a new dialogue of stakeholders that are responsible for an area in talking about maintenance of an area, about monitoring, about safe precautions, and disaster preparedness. So, I'm sure that's one of the benefits of this sanctuary being established and there's probably oil and gas industry folks at the table with your advisory council. Would I be correct there?
- Shelley DuPuy:* Yes, you would be correct there.
- Jennifer Stock:* Good.
- Shelley DuPuy:* We do have oil and gas represented on our sanctuary advisory council and you're right, it does open, because of the regulations

surrounding the sanctuary that are just a little bit more stringent than other place where the oil companies might need to drill, it does open up that dialogue and there are times, for example, when, you know, maybe they could move over a mile and still accomplish what they need to accomplish and be that much further from the Flower Garden Banks when if the sanctuary wasn't there, they wouldn't even know that was a concern and I know we had...when some activity was going on at the gas platform inside the sanctuary, we had an observer out there to advise and help them adhere to the regulations and the guys that worked on the platform were just really protective of the reef because once they learned what was down there and saw the pictures and the video, they were like, "Well, yeah. We understand why we need to do this."

So, they were all very protective and they would even report vessels that they thought were not supposed to be in the sanctuary and they were very helpful in letting us know when there might be someone there that shouldn't be there.

Jennifer Stock:

That's great. Sounds like good cooperation between...So, what are...we have just about five minutes left and I just want to hear, you know, since this is the 15th anniversary of the sanctuary, what are some of the successes that you'll be thinking about this year and celebrating as well as challenges that the sanctuary looks to be addressing in the next few years?

Shelley DuPuy:

Well, I'd definitely say our relationship with the oil and gas industry is one big success of the sanctuary that happened early on. We've also developed a lot of good relationships with a lot of different universities. I think one of the strengths of our program is the variety of researchers that are interested in the Flower Garden Banks and the new and innovative types of research that they're doing and hope to try out at the sanctuary. So, partnerships, I think, is one of our biggest successes. I would also say that one of our most recent successes is finally getting our office, located on the coast where we have a gateway community and someone...a specific audience that we can reach out to and help start building that greater sense of stewardship for people who may never get to visit the sanctuary.

So, I would say those are three of our big successes.

Jennifer Stock:

Excellent. How about one of your favorite moments at the Flower Garden Banks. There's a pretty unique time of year out there that is

hard to describe on the radio, but why don't you give it a shot as far as some of the interesting natural history you've observed on the Flower Gardens.

Shelley DuPuy:

Oh, there's so many special moments, but I would have to say there are two that stand out for me. There's so much to see on the reef and I'm one of those people that likes to get down and look at the little details, but when you do that you don't see the bigger stuff, but watching the cleaning stations where the little, small fish will hang out in a certain place so the bigger fish can come up and be cleaned and it's amazing to me how for that moment in time, the grouper who would ordinarily eat that little wrasse calls a truce and says, "Ok. I'm going to sit here and open my mouth. I'm going to trust you," and the little wrasse will go in and pick the parasites out of his gills, out of his mouth, around his back, and then at some point, and I've never been able to figure out what the signal is, they both say, "Ok. The truce is over."

The Grouper leaves and the little wrasse waits for the next fish to come into the peace zone, as I think of it. So, how that works to me is totally amazing. The other moment would be some of the larger stuff. If you're scuba diving, you know that you're generally advised to take a safety stop at about 15 to 20 feet you just stop to let your blood release nitrogen and you just sit there for 3 to 5 minutes and I typically sit there for more like 10 to 15 minutes because then you can hold on to the rope and just look around you and when you see the manta rays go through, they're these just magnificent graceful creatures that are moving...it appears slowly, but if you even try to swim and keep up with them, they're really truckin', but the ones at the Flower Gardens are typically around 10 to 15 feet wingspan and they're just so peaceful-looking just winging their way through the water. Gliding along.

Jennifer Stock:

It sounds so special. So, Shelley, what is the one that you'd like to share with your listeners, with the listeners here today, about their role in protecting the ocean as a whole?

Shelley DuPuy:

I would just like everyone to stop and realize that your personal lifestyle does matter. It may not seem like a lot, but when you conserve your water by turning it off while brushing your teeth or you use a biodegradable soap instead of...maybe one that has less friendly substances in it or when you use organic garden practices...all those little things add up because, remember, it's not just you. You're multiplying it by the population of the world.

Jennifer Stock: So, if we all did one thing. It'd be pretty good.

Shelley DuPuy: That's right.

Jennifer Stock: Well, thank you, Shelley, so much for giving us a quick overview of the Flower Garden Banks in the Gulf of Mexico. The Flower Garden Banks National Marine Sanctuary is celebrating its 15th year anniversary this year and I know that you just recently went through an incredible web redesign and your website has beautiful pictures to explain this unique place and I wanted to see if you could give us the website again and any other resources where people might be able to learn more and see the Flower Gardens in person.

Shelley DuPuy: Our website is flowergarden.noaa.gov.

Jennifer Stock: That's garden with no "s."

Shelley DuPuy: Correct.

Jennifer Stock: Okay.

Shelley DuPuy: So, it's singular and we do have that watershed activity on there where you can go find out exactly which states drain into the Gulf of Mexico. That would be under our teacher resources and any additional resources, there will be links from our website.

Jennifer Stock: Excellent. Well, thanks.

Shelley DuPuy: The weather one is a really cool one.

Jennifer Stock: Oh, the weather. Watching the weather?

Shelley DuPuy: Yeah.

Jennifer Stock: Cool.

Shelley DuPuy: Wave heights.

Jennifer Stock: Well, Shelley, thanks again for joining us today on Ocean Currents and please stay tuned and those of you listening in just a few moments we'll have Krist Jake from the San Francisco Ocean Film Festival coming or calling in to talk a little bit about what's going on and Shelley, have a great anniversary year celebrating all year. I

know you've got a big event coming up. I hope it goes well and we'll talk to you another time.

Shelley DuPuy: Okay, thank you, Jennifer. It's been a pleasure.

Jennifer Stock: Take care.

Shelley DuPuy: Bye bye.

Jennifer Stock: Thanks for joining me today on Ocean Currents and like I said earlier, we are moving Ocean Currents to Thursdays. It will be one day a month. My next show will be February 8th, Thursday at 5:30pm, rebroadcast the following week and you can always catch archives of Ocean Currents at our website at the Cordell Bank National Marine Sanctuary website, cordellbank.noaa.gov and I was thinking a little bit about Martin Luther King, Jr. while getting ready for today's show because today is a day that we honor him and I was thinking of quotes that were relative to us now as people thinking about the future and as Shelley was saying earlier that we all have a role in protecting the ocean, even if we live in Kansas and Iowa. The littlest things that we do and as Martin Luther King, Jr. said, "The time is always right to do what is right." So, be well and enjoy this day that we honor Martin Luther King, Jr. and we'll see you February 8th.